

Claims

1. An isolated polynucleotide comprising:
- (a) a polynucleotide encoding the polypeptide shown in SEQ ID NO 2;
 - 5 (b) a polynucleotide encoding the polypeptide encoded by the DNA contained in National Collection of Industrial, Food and Marine Bacteria Limited (NCIMB) Deposit No. 41101;
 - (c) a polynucleotide comprising a nucleotide sequence of SEQ ID NO 1;
 - 10 (d) a polynucleotide comprising a nucleotide sequence that has at least 75% identity to the polynucleotide of any one of (a) to (c);
 - (e) a polynucleotide comprising a nucleotide sequence which is capable of hybridising to the polynucleotide of any one of (a) to (c); or
 - (f) a polynucleotide fragment of the polynucleotide of any one of (a) to (e).
- 15 2. The polynucleotide of claim 1, wherein said polynucleotide encodes a G-protein coupled receptor.
3. A polynucleotide probe or primer comprising at least 15 contiguous nucleotides of the polynucleotide of claim 1.
- 20 4. A vector comprising the polynucleotide of claim 1.
5. A host cell transformed or transfected with the vector of claim 4.
- 25 6. The host cell of claim 5 which is mammalian.
7. A process for producing a polypeptide comprising culturing the host cell of claim 5 under conditions sufficient for the expression of said polypeptide.
- 30 8. The process of claim 7, wherein said polypeptide is expressed at the surface of said host cell.

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9. Polypeptides produced by the process of claim 7.
10. A membrane preparation of the cells of claim 8.
- 5 11. A polypeptide comprising:
- (a) a polypeptide having the deduced amino acid sequence translated from the polynucleotide sequence in SEQ ID NO 1 and variants, fragments, homologues, analogues and derivatives thereof;
 - 10 (b) a polypeptide of SEQ ID NO 2 and variants, fragments, homologues, analogues and derivatives thereof; or
 - (c) a polypeptide encoded by the cDNA of NCIMB Deposit No. 41101 and variants, fragments, homologues, analogues and derivatives of said polypeptide.
12. A pharmaceutical composition for the treatment of a patient having need to upregulate a receptor, said pharmaceutical composition comprising the polypeptide of claim 11.
- 15 13. An antibody against the polypeptide of claim 11.
- 20 14. A pharmaceutical composition for the treatment of a patient having need to activate or inhibit a receptor, said pharmaceutical composition comprising the antibody of claim 13.

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15. A method for identifying a compound that binds to the polypeptide of claim 11, said method comprising the steps of:

- 5 (a) contacting (i) a detectable compound known to bind to said polypeptide and (ii) a test compound with cells expressing said polypeptide or a membrane preparation of said cells;
- (b) contacting the same amount of said detectable compound with the same amount of said cells or a membrane preparation of said cells under the same conditions as in step (a) but in the absence of said test compound; and
- 10 (c) comparing the amount of said detectable compound bound in steps (a) and (b), thereby identifying said test compound as a compound that binds to said polypeptide.

16. The method of claim 15, wherein said detectable compound is a nucleotide or nucleotide derivative.

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17. A method for identifying a compound that binds to and activates the polypeptide of claim 11, said method comprising the steps of:

- 20 (a) contacting said compound with cells expressing on the surface thereof said polypeptide or a membrane preparation of said cells, said polypeptide being associated with a second component capable of providing a detectable signal in response to the binding of said compound to said polypeptide; said contacting being under conditions sufficient to permit binding to said polypeptide; and
- (b) identifying said compound as binding to and activating said polypeptide by detecting the signal produced by said second component.

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18. A method for identifying a compound that binds to and inhibits activation of the polypeptide of claim 11, said method comprising the steps of:
- (a) contacting (i) a detectable first component known to bind to and activate said polypeptide and (ii) said compound with cells expressing on the surface thereof said polypeptide, or a membrane preparation of said cells, said polypeptide being associated with a second component capable of providing a detectable signal in response to the binding of said compound to said polypeptide; said contacting being under conditions sufficient to permit binding to said polypeptide; and
 - (b) identifying said compound as binding to and inhibiting activation of said polypeptide by determining whether said first component binds to said polypeptide by detecting the absence or otherwise of a signal generated from the interaction of said first component with said polypeptide.
19. A microorganism as deposited under the accession number NCIMB 41101 at the National Collections of Industrial, Food and Marine Bacteria Ltd.
20. A method of elucidating the three-dimensional structure of the polypeptide of claim 11, said method comprising the steps of:
- (a) purifying said polypeptide;
 - (b) crystallising said polypeptide; and
 - (c) elucidating the structure of said polypeptide by X-ray crystallography.
21. A method of modelling the structure of the polypeptide of claim 11, said method comprising the steps of:
- (a) aligning the sequence of said polypeptide with the sequence of rhodopsin;
 - (b) mapping the detected sequence differences of said polypeptide onto the known structure; and
 - (c) deriving a homology model of said polypeptide.

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